Supplemental Figure Legends

Figure S1. Characterization of Th17 and GD17 cells. RNA from total spleen, flow cytometry sorted $CD3^+GL3^+$ cells from spleen and 2 batches of flow cytometry sorted GD17 from 24h *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) infected Thy1.1 reporter mice were isolated by TriZol methods. Vγ chain usage on these cells was determined by RT-PCR (A) and confirmed by flow cytometry in infected reporter mice (B). (C) C57BL/6 mice were immunized intranasally with 20 μg of heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and sacrificed 1, 2 and 4 weeks after. Lung, spleen and mediastinal lymph nodes were collected and intracellular staining was performed. Each time point has a group of 3 mice. Representative flow cytometry plots of IL-17A and IFN-γ staining on CD4 gated cells in the lung (upper panel) and the mediastynal lymph nodes

(lower panel). (D&E) IL-17F-Thy1.1 reporter mice were immunized intranasally with 20 μg heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and Day 7 and sacrificed on Day14. Naïve mice were sacrificed 24h after 10^4 live *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) infection and mononuclear cells in the lung were harvested. flow cytometry sorted splenic $CD4^+CD44low$ (naïve CD4), splenic $CD3^+GL3^+$ (spleen GD), nTh-non17F, GD17 and Th17 were lysed in TriZol and RNA were extracted. Expression of transcription factors (D) and cytokine and chemokine receptors (E) was analyzed by real-time RT-PCR. (F) flow cytometry sorted GD17 and Th17 cells were cultured with heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) and irradiated Rag1 splenocytes as APC in the presence or absence of neutralizing antibodies against IL-1β and IL-23 for 4 days. IL-17 in the supernatants was measured by Luminex.

Figure S2. Antibody responses and protection in immunized *Ighm*$^{-/-}$, IL17RA KO mice and CD4 depleted mice. (A) *Ighm*$^{-/-}$, C57BL/6 and IL17RA KO mice were immunized intranasally with 20 μg heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and Day 7. 4 weeks after the 2nd immunization, naïve unimmunized and immunized mice were sacrificed and IgG levels in the lung homongenates against *K*. *Pneumoniae*-43816 (ATCC) were measured. (B) *Ighm*$^{-/-}$ and age matched C57BL/6 mice were immunized intranasally with 20 μg heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and Day 7. 4 weeks after the 2nd immunization, naïve unimmunized and immunized mice were infected with 10^4 live *K*. *Pneumoniae*-43816 (ATCC) (serotype K2). Mice are

sacrificed at 24h and bacterial burden was assessed by CFUs. (C&D) C57BL/6 with or without CD4 depletion (0.3mg GK1.5 I.P. weekly) mice were immunized intranasally with 20μg heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and challenge with 10^4 *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) on Day28. Mice were sacrificed at 24h and bacterial burdens in the lungs and spleens were analyzed by CFU (C). anti-*K*. *Pneumoniae*-43816 (ATCC) (serotype K2) antibody responses were measure by Klebsiella specifc IgG in the lung homogenate (D).

Figure S3. (A) Serum from immunized mice killed autologous but not heterologous Klebsiella *in vitro*. *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) or *K*. *Pneumoniae*-396 (serotype K1) were grown into log phase and diluted to 10000/mL in TSB medium. 100μL were added to 96-well plate with 50μL serum from naïve or *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) immunized mice. OD600 was measure at indicated time points. (B) Proliferation of Th1 cells upon restimulation. Mediastinal lymph nodes from *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) immunized C57BL/6 mice were labelled with CFSE and cultured with different serotypes of heat-killed *K. pneumoniae*, *E. coli*, *S. aureus* and *S. pneumoniae* for 3 days. Proliferation of IFN-γ^+ cells was analyzed by intracellular IFN-γ staining and CFSE dilution. (C) *Ighm*$^{-/-}$ mice were immunized intranasally with 20 μg heat-killed *K*. *Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and Day 7. 4 weeks after the 2nd immunization, immunized *Ighm*$^{-/-}$ mice and naïve-unimmunized *Ighm*$^{-/-}$ mice were infected with 10^4 live *K*. *Pneumoniae*-396

(serotype K1) and sacrificed 24h after. A group of immunized mice also received i.t. neutralizing antibody against IL-17 right before infection. IL-17 protein in the lung were analyzed by and Luminex.

Figure S4. Immunization induced Th17 cells respond to outer membrane proteins. C57BL/6 mice were immunized intranasally with 20μg heat-killed *K. Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and sacrificed on Day28. Mediastinal lymph nodes (MLN) were labelled with CFSE and cultured with 10μg/mL OMPs from *K. Pneumoniae*-43816 (ATCC) (serotype K2) (KP) or recombinant OmpA from *E. coli* in the presence of irradiated splenocytes for 4-5 days. Proliferation of gatedTh17 cells was analyzed by CFSE dilution. Percentages of proliferating cells were indicated. (C&D) Immunization induced long-term memory Th17 cells. C57BL/6 mice were immunized intranasally with 20μg heat-killed *K. Pneumoniae*-43816 (ATCC) (serotype K2) at Day 0 and sacrificed on Day28. Mediastinal lymph nodes (MLN) and Lung single cells from Collagenase digest were restimulate with PMA and Ionomycin in the presence of BFA for 5h. Cells were then stained with CD4, CD25, CD44, CD62L, CD69 and CD127 before fixed and permeabilized by BD Fix/Perm buffer and stained with IL-17 and IFN-γ intracellularly.

Table S1. List of serotypes and mucoid phenotypes of endemic isolates obtained from Southeast Asia where *K. pneumoniae* liver and lung abscesses and New Delhi metallolactamase ($NMD1^+$) strain from ATCC.